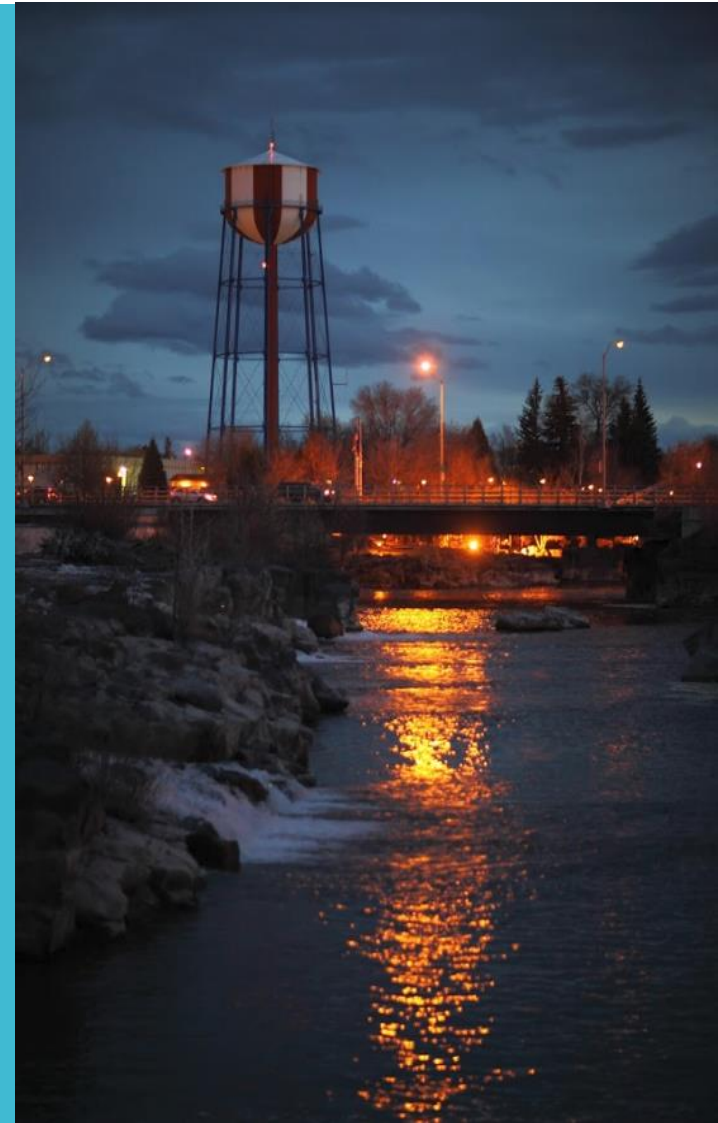


CITY OF IDAHO FALLS

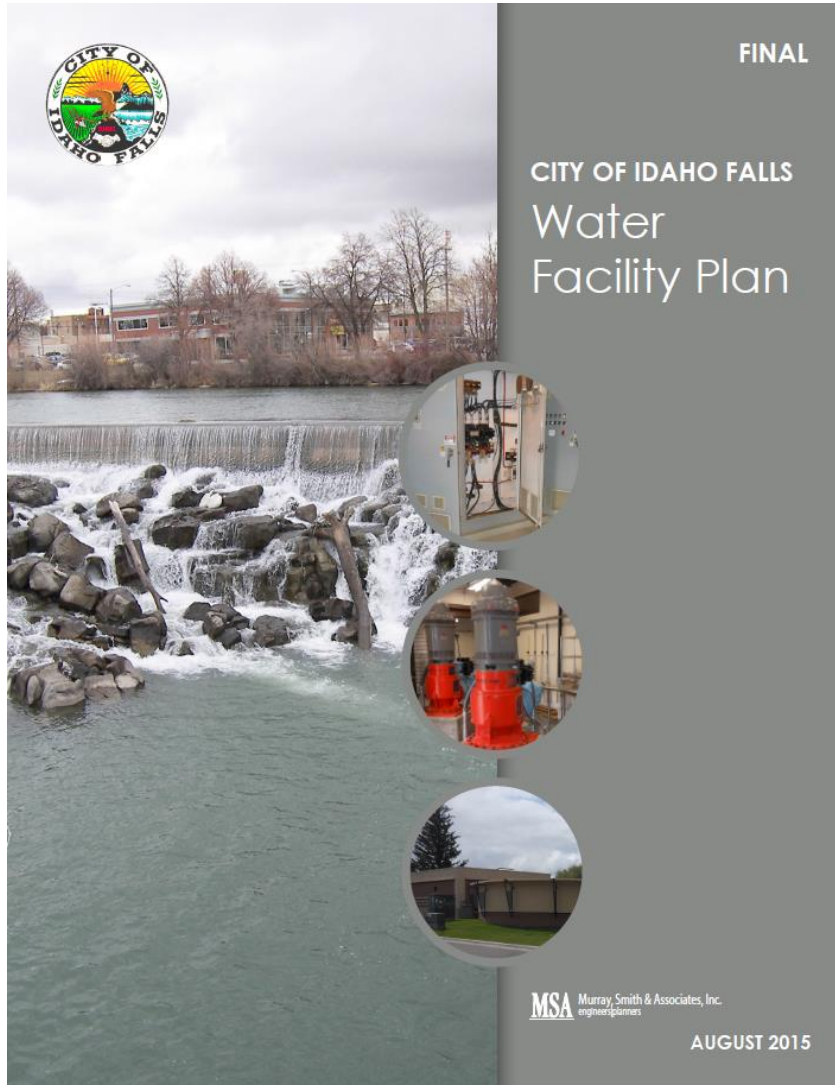
Elevated Water Tower

Chris Fredericksen, Public Works Director

David Richards, PE, Water Superintendent



Water Facility Plan



Facility Plan (Aug. 2015):

- System Evaluation
 - All well sites were evaluated from multiple facets to identify deficiencies.
 - Well site needs ranked.
- Capital Improvement Program
 - Capital projects created and prioritized to address condition and deficiencies.
- Financial Plan
 - Rate Analysis created to finance capital projects.

Well Site Deficiency Evaluation

Figure 6-1
Well Ranking vs Average Daily Production

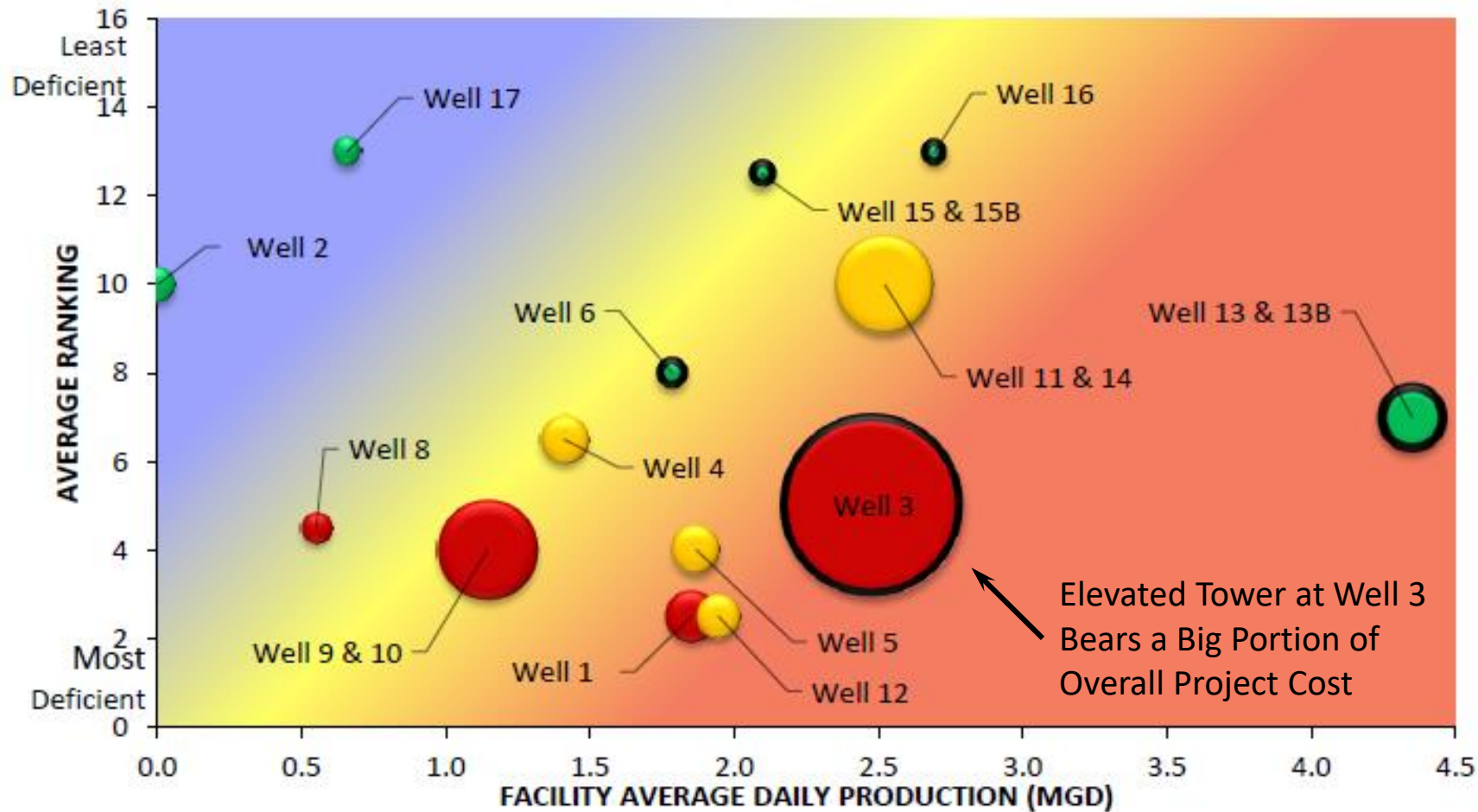


Figure 6-1 Key

- Size of circle indicates relative cost of improvements.
- Black outer bands indicate wells used year-round.
- Color of circle indicates well facility risk of failure.

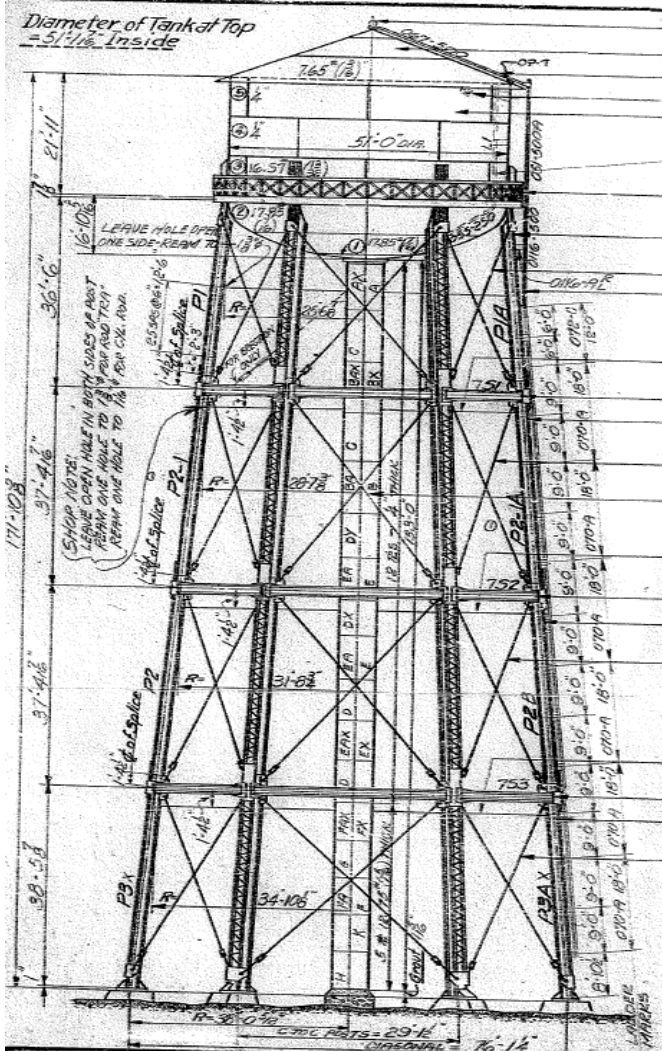
Water Tower Purpose

- Establishes pressure for the water system.
 - All water system pumps match pressure supplied by the elevated water tower.
- Provides reliable pressurized water during times of:
 - Peak water use
 - Firefighting
 - Emergencies
 - Power outages
- Prevents contamination of the water system.
 - Provides contact time for chlorination
 - Inhibits backflow through constant pressure
- Resides nearly in the center of the city.
- Ground-level tanks are cheaper to build, but require:
 - Larger footprint
 - An additional pump station
 - More life-cycle operations & maintenance costs
- Water storage for future City growth



Water Tower History

- Constructed in 1937; 82 years old
- Built by Chicago Bridge & Iron Company
- Style Called "Horton Tank," Named After Company Owner
- Holds 500,000 gallons; max height of 185' at peak
- Original color: silver/gray; colored red, white and blue for 1976 Bicentennial



Elevated Tower Construction Drawing



Tower Construction Placard

Water Tower Deficiencies

- Paint
 - Base paint coats losing adhesion
 - 1997 CH2M Hill report:
 - High lead content in base coat paint
 - Recommended sandblasting & recoating tower
 - Roof top-coated white for \$24,890

Tower Roof



Tower Wall



Paint System Failure



Water Tower Deficiencies

Lead Paint Mitigation

- 2008 EXTECH Corrosion Analysis:
 - Confirmed lead paint in base coat
 - Recommended eventual sand blasting and recoating
 - Mitigate lead paint removal



Tented Elevated Tower



Water Tower Deficiencies

Pier Foundation Cracking

- Pier foundations
 - Last replaced in 1969
 - Surface cracking of exposed foundations



Water Tower Deficiencies

Inlet and Outlet Piping Corrosion

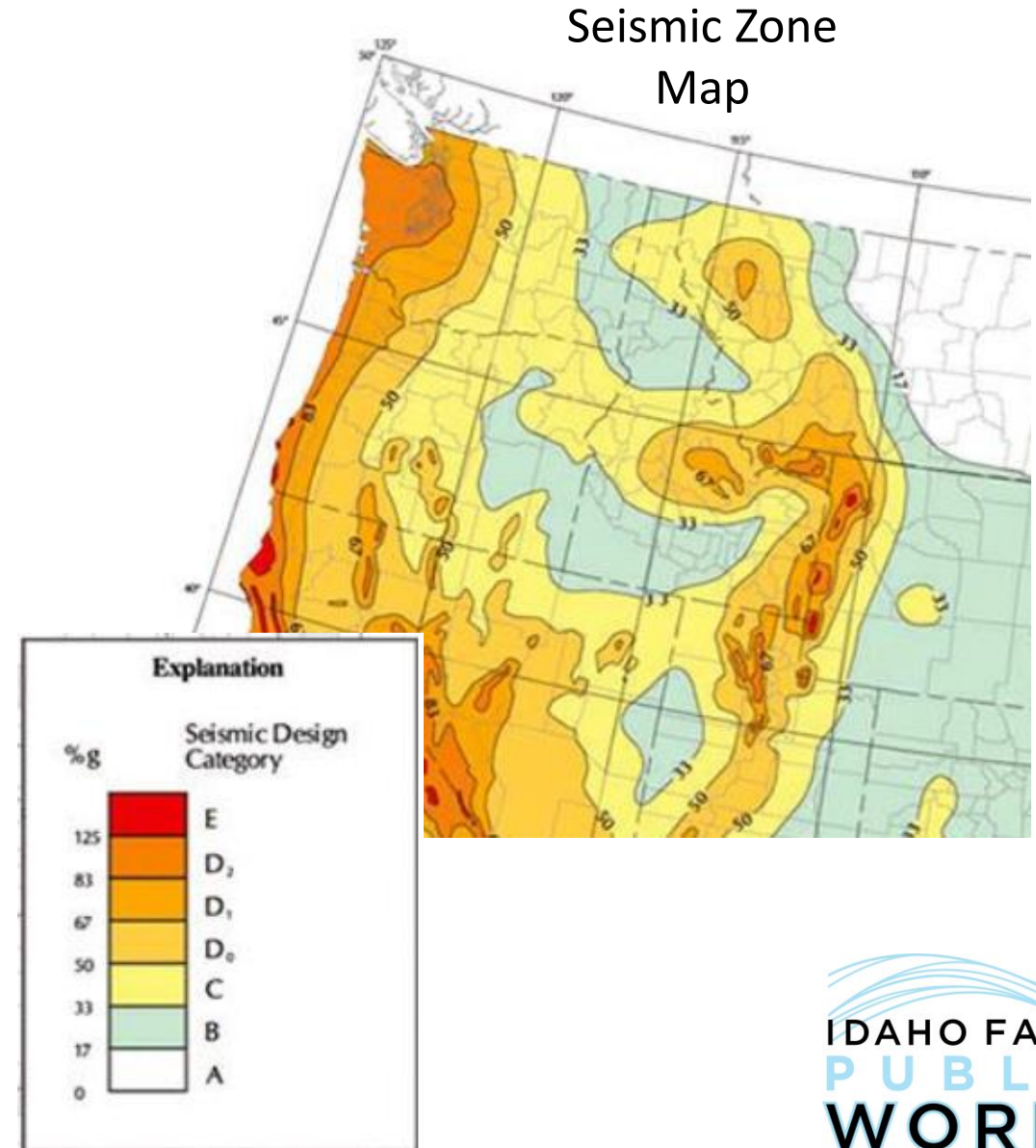
- Inlet and outlet piping
 - Significant corrosion in vault.
 - Cast iron pipe with lead joints.



Housed in red access tube

Water Tower Deficiencies

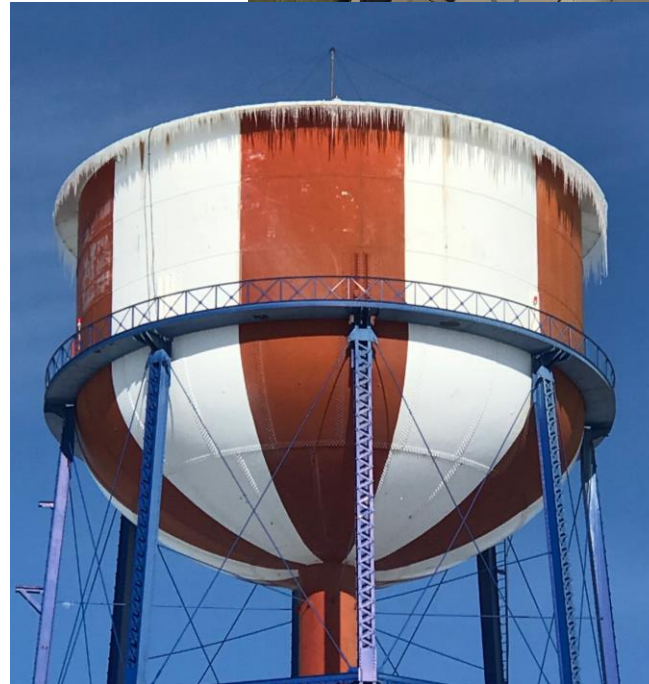
- Seismic Conditions
 - Built when seismic codes were first being established.
 - G&S Structural Engineers consult (2008):
 - Lack of materials and construction data;
 - Proper evaluation requires a reverse design, including low-grade material assumptions;
 - Recommended removing tower from service based on seismic & cost concerns.



Water Tower Deficiencies

- Location Safety
 - Between Idaho Falls Power's Administration Building and the Central Power Plant
 - Limits Idaho Falls Power's ability to expand.
 - IFP vehicles regularly park below tower.
 - Icicles form in winter & fall over employee walk path.

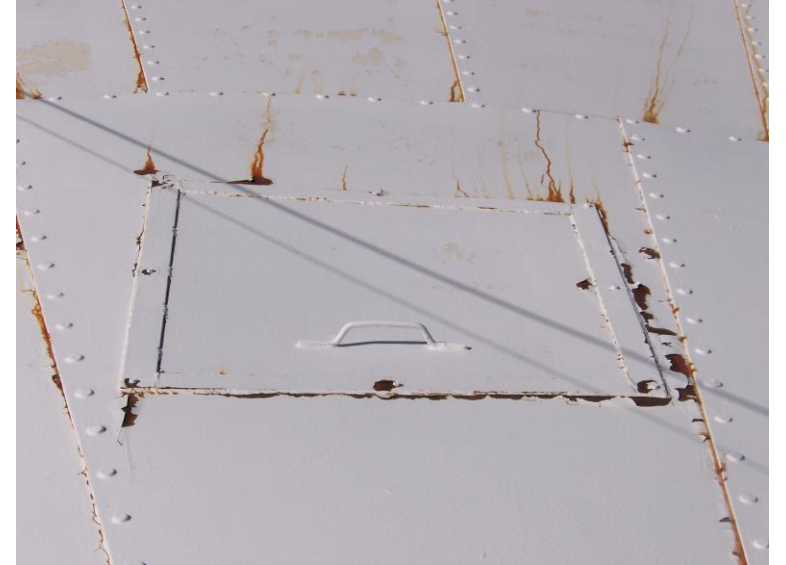
Roof Icicle Formation



Water Tower Deficiencies

- Code & miscellaneous upgrades:
 - Updated safety ladder & walk path railing.
 - Miscellaneous upgrades (hatches, ventilation, etc.).
 - Replacement of deteriorated welds
- Even after improvements, tower may not meet current seismic zone requirements

Non-compliant Roof Hatch



Cracking Welds



Seismic Zone Allowed Tower Types



Composite Tower

Steel Bowl With
Concrete Pedestal



Multi-Column Tower

All Steel Construction



Fluted Column Tower

All Steel Construction



Multi-Leg Tower

All Steel Construction

Seismic Zone Allowed Tower Types



Recommended

Composite Tower

Steel Bowl With
Concrete Pedestal



Not Recommended

Multi-Column Tower

All Steel Construction



Not Recommended

Fluted Column Tower

All Steel Construction



Not Recommended

Multi-Leg Tower

All Steel Construction

Concrete construction of pedestal reduces maintenance costs over lifecycle.

Replacement Tower Siting Evaluation

- Existing tower must remain in service until new tower is placed into service
 - New tower requires a new location
- 2018 Siting Analysis:
 - Six (6) preferred sites initially identified:
 - City-owned properties
 - Near existing well and drainage
 - Adequate room for construction
 - Sites discussed with stakeholders



- Green Square: Construction footprint**
- Outer Blue Circle: Circumference of bowl footprint**
- Inner Blue Circle: Circumference of pedestal footprint (30ft)**

Replacement Tower Siting Evaluation

- List reduced to three (3) feasible sites after stakeholder discussions
- Consultant generated renderings for each site



- **Red Squares: Not feasible**
- **Green Square: Construction footprint**
- **Outer Blue Circle: Circumference of bowl footprint**
- **Inner Blue Circle: Circumference of pedestal footprint (30ft)**

Replacement Water Tower Renderings

Rendering Site #1



South Capital Park,
south of Art Museum



**The replacement tower will be the same height as the current tower, but will hold twice the volume. Towers appear to be shorter in the rendering due to location and perspective.*

Replacement Water Tower Renderings

Rendering Site #2



Parking lot between
Idaho Falls Library &
State of Idaho Building



**The replacement tower will be the same height as the current tower, but will hold twice the volume. Towers appear to be shorter in the rendering due to location and perspective.*

Replacement Water Tower Renderings

Rendering Site #3



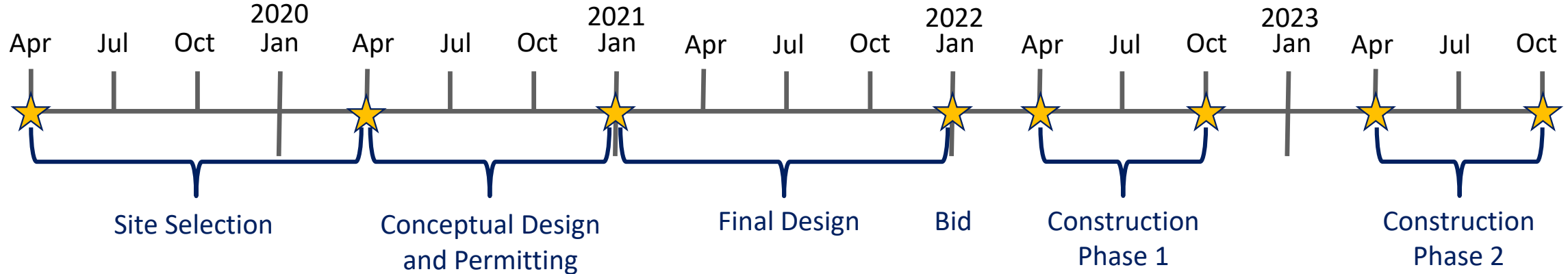
Parking between
State of Idaho
Building and Willow
Tree Gallery



**The replacement tower will be the same height as the current tower, but will hold twice the volume. Towers appear to be shorter in the rendering due to location and perspective.*

Water Tower Construction Schedule

Anticipated Schedule



Water Tower Construction

- Site Selection – April 2019 to April 2020 (includes public input)
- Conceptual Design and Permitting – April 2020 to January 2021
- Final Design – January 2021 to January 2022 (includes public input for coating design)
- Bid Opening – January 2022
- Construction Phase 1 (foundation & column) – April 2022 to October 2022
- Construction Phase 2 (steel bowl & coating) – April 2023 to October 2023

Existing Tower Removal

- Bid Removal Contract – January 2024
- Removal of Existing Water Tower – Spring 2024

Water Tower Construction Cost Comparison

New Tower Estimated Project Costs

• Water Tower Construction:		
▪ <u>1 Million Gallon</u> Composite Elevated Tower.....	\$2,500,000	
▪ Tower Foundation	\$260,000	
▪ Supply and Outfall Piping	\$104,800	
▪ Mobilization.....	\$429,700	
▪ Materials Sales Tax	\$167,000	
▪ Contractor Overhead and Profit.....	\$286,500	
▪ Contingency	\$1,124,400	
• Project Related Costs:		
▪ Admin, Legal, Engineering, Construction Admin.....	\$1,461,600	
▪ Tower Removal, Mitigation.....	\$100,000	
<hr/> <u>Total Estimated Project Cost for Replacement:</u>		<u>\$6,434,000</u> (Distributed Over Multiple Fiscal Years)

Water Tower Construction Cost Comparison

New Tower Estimated Project Costs

- Water Tower Construction:
 - **1 Million Gallon** Composite Elevated Tower..... \$2,500,000
 - Tower Foundation \$260,000
 - Supply and Outfall Piping \$104,800
 - Mobilization..... \$429,700
 - Materials Sales Tax \$167,000
 - Contractor Overhead and Profit..... \$286,500
 - Contingency \$1,124,400
- Project Related Costs:
 - Admin, Legal, Engineering, Construction Admin..... \$1,461,600
 - Tower Removal, Mitigation..... \$100,000

Total Estimated Project Cost for Replacement: **\$6,434,000**

(Distributed Over Multiple Fiscal Years)

Existing Tower Estimated Project Costs

- Tower Improvements
 - Paint Removal, Mitigation, Recoating **500,000 Gallon** Tower \$600,000
 - Foundation Replacements (8 Total)..... \$400,000
 - Tower Upgrades, Materials Sales Tax \$300,000
 - Project Related Costs, Contingency..... \$1,007,000

Total Estimated Project Cost for Rehabilitation: **\$2,307,000**

*Improvements to the existing tower will NOT help the tower meet seismic zone requirements or provide additional storage for future growth.

QUESTIONS?

A copy of this presentation, as well as additional information regarding the City's elevated tower has been posted on the City's website:

<https://www.idahofallsidaho.gov/DocumentCenter/View/8790/2019-Water-Tower-Presentation>

To submit your preferred location online, please send an email containing your preference to: watertower@idahofallsidaho.gov

